

ABSTRACT

Twisted blades for outdoor air conditioner condensers and heat pumps that improve airflow efficiency to minimize operating power requirements. The blades can run at approximately 850 rpm to produce approximately 1930 cfm of air flow using approximately 110 Watts of power from an 8-pole motor with an improved diffuser assembly. Using an OEM 6-pole 1/8 hp motor produced approximately 2610 cfm with approximately 145 Watts of power while running the blades at approximately 1100 rpm. Power savings were approximately 24% (40 to 50 Watts) over the conventional configuration with increased air flow. Embodiments of two, three, four and five blades can be equally spaced apart from one another about hubs. Additionally, a novel noise reduction configuration can include asymmetrically mounted blades such as five blades asymmetrically mounted about the hub. Additional features can include conical diffusers with or without conical center bodies were shown to further improve air moving performance by up to 21% at no increase in power. Embodiments coupled with electronically commutated motors (ECMs) showed additional reductions to condenser fan power of approximately 25%. A strip member, such as open cell foam can be applied as a liner to the interior walls of a condenser housing adjacent to the wall surface where the rotating blades sweep against. The porous edge can also be used with the trailing edge and/or tip edge of the blades. These member can both improve air flow by reducing dead air spacing between the rotating blade tips and the interior walls of the condenser housing, as well as lower undesirable noise sound emissions.